E. T. GILLILAND.

Watchmen's Electric Time-Recorders.

No. 155,940. Patented Oct. 13, 1874.

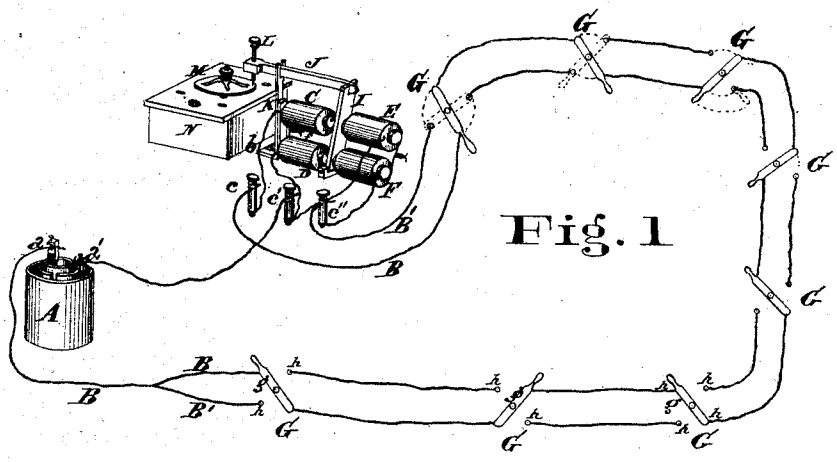


Fig. 1

Fig. 2

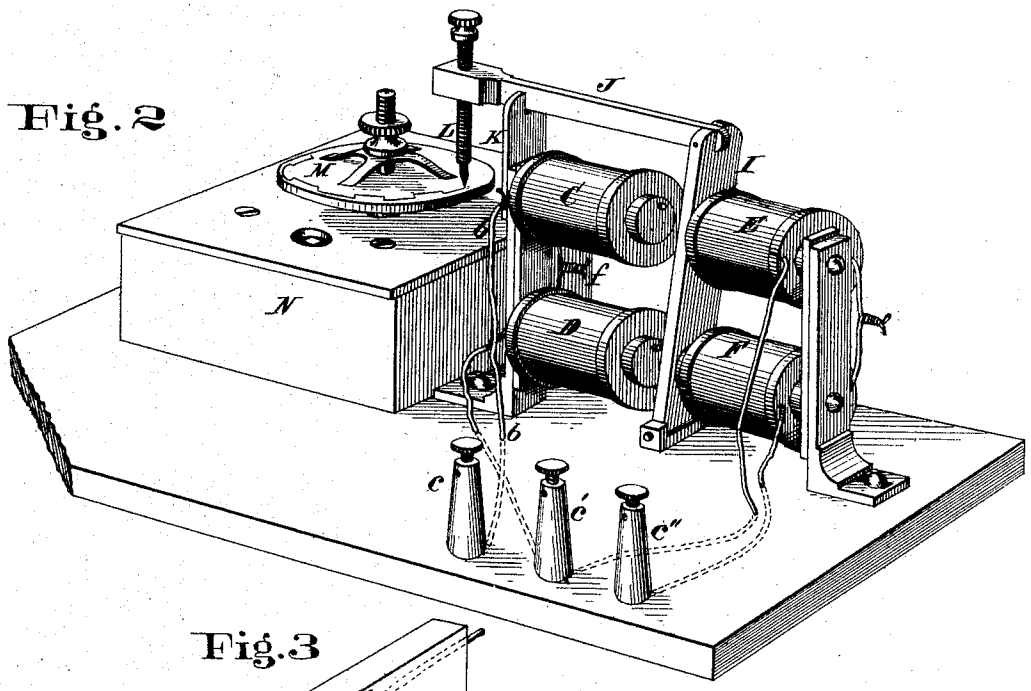
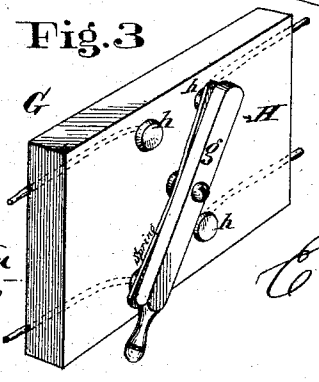


Fig. 3



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UNITED STATES PATENT OFFICE.

EZRA T. GILLILAND, OF CINCINNATI, OHIO, ASSIGNOR TO HIMSELF AND CHARLES SELDEN.

IMPROVEMENT IN WATCHMEN'S ELECTRIC TIME-RECORDERS.

Specification forming part of Letters Patent No. **155,940**, dated October 13, 1874; application filed June 26, 1873.

To all whom it may concern:

Be it known that I, EZRA T. GILLILAND, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a certain new and useful Electro-Magnetic Watchman's Detector, of which the following is a specification:

My invention relates to that class of devices called watch-clocks, detectors, tell-tales, &c., designed to record the punctual and faithful performance of duty by watchmen, either during the night or by day, in manufactories or other large buildings through which the watchman makes periodical rounds, his presence at any point at a stated time being signified by the action of some recording machinery operated by him from that point, and usually so arranged as to record upon some tablet (inaccessible to him) the time of its being so operated, or, in case of his non-punctuality, to deprive him of the opportunity of making any record; and my invention consists of an electro-magnetic telegraph, having a double circuit of contiguous wires throughout the building, with peculiarly-constructed switches at the desired points, and connected at the office or other convenient place of security with a registering apparatus consisting of two pairs of electro-magnetic coils, having between them an armature consisting of an upright bar of iron, pivoted at the lower end so as to vibrate freely between the magnets. This armature carries at its upper end an arm resting on a slot in the frame, which holds a pencil or marker whose point rests upon a dial of suitable material—as, for instance, paper, porcelain, ivory, or slate—upon which each vibration of the armature is automatically registered, so that the exact time of the completion of the circuit is recorded upon the dial, and the clock, dial, and recording apparatus being locked up in some position inaccessible to the watchman, cannot be tampered with by him or made to present a false record.

Figure 1 is a general view of a telegraphic apparatus embodying my invention. Fig. 2 is a perspective view of my registering device, showing the magnets, clock, and dial, and their appendages. Fig. 3 is a perspective view of the switch used.

A is the battery, from one pole of which starts the wire B, dividing into parallel parts B B′, which make the circuit of the building or beat, returning to the position of the register, which, together with the battery, should be locked up in some convenient place, inaccessible to the watchman. By means of the posts *c c′ c″* the wire is attached to the magnetic coils or helices C D E F as follows: The wire B is attached to the post *c*, which connects it with wire *b* at one end of the helix C, and from thence the wire proceeds through connection *f* to the lower helix D, from whence it finally returns to post *c′*, whence it communicates with pole *a* of the battery. By a similar arrangement, wire B′ is attached through *c″* to the helical coils E F. At each station at which the watchman's duty requires his periodical presence is placed a switch, G, at which both of the wires are interrupted, the four ends terminating in four metallic studs, *h*, insulated in the switch-board H. The switch-lever *g*, pivoted centrally between these four studs, forms the connecting-link, being set so as to connect the wires from alternate ends and thus make either wire B or B′ continuous.

The watchman passing around his beat, as he reaches each station, sets the levers *g* successively into the position shown, to secure a continuous circuit from A to *c*, which, passing the electric current through the coils C D, converts them into electo-magnets. An armature or bar of soft iron, I, pivoted at its lower end between the magnets C and E, so as to vibrate freely between the magnets C E, is now attracted against C. Attached to its upper extremity is a slide, J, resting in a slot on the upper end of the frame K and carrying an upright pencil or stylus, L, whose point is adjustable and rests in contact with the revolving dial-plate M of a common clock, N. The vibration of the armature pushes the pencil forward, making a radial line upon the dial, showing, by its position, the hour and minute at which the circuit was completed. While remaining in this position it traces a concentric line on the moving dial. At the next round made by the watchman, he reverses each lever *g* as he arrives at its station, and

when he has reached the last the former circuit is broken at each switch in succession as he passes on and the opposite one completed, by this succession of reversals of the switches, this time the current passing through the magnets E F. The armature is now attracted by them and the pencil-point is thereby retracted, making another radial line at the time of completion, and then continuing in a line concentric to and outside of the line of the first until another round has been made and the first operation repeated, when the registering-point returns to the inner line again, thus forming a wavy line upon the dial, consisting of short arcs of different diameters connected by radial lines, which records the exact period of time at which each circuit was completed, showing the presence of the watchman at each station on the line and time of arrival at the last. Should he, from carelessness, omit a single station only, the circuit would be broken and the armature left loose. His employer, in the morning, can unlock the case in which the recording apparatus is kept and find a complete record of the watchman's rounds. The dial may then be cleaned or replaced, the clock wound up and prepared for another night.

A modification of this device, having some advantages, consists in replacing the last switch on the line by a simple circuit-closer, so that the circuit remains continally open except at the time of the arrival of the watchman at the last station, when he momentarily closes it, thereby changing the marker from one line to the other.

I claim—

The combination, in a watchman's time-register, having two sets of magnets with an interposed armature operating the marking mechanism, of the two circuits, B B′, each connected to one pole of the battery at one end, and to different magnets at the other, and the switches *g g*, arranged to break circuit through one and close circuit through the other set of magnets, the closing of the one circuit being incomplete until the last switch of the series be manipulated, all substantially as and for the purpose specified.

In witness of which invention I hereunto set my hand.

E. T. GILLILAND.

Witnesses:

FRANK MILLWARD,

J. L. WARTMANN.